Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

Cooperative Extension Work in Agriculture and Home Economics

Extension Service Circular 343 October 1940

LIBRARY OF THE
OFFICE OF EXPERIMENT STATIONS
NOV 1 1940
EXPERIMENT STATION FILE

USE OF VISUAL AIDS[1]

IN

COOPERATIVE EXTENSION WORK

IN AGRICULTURE AND HOME ECONOMICS

By

J. E. McClintock, Extension Editor

The Ohio State University

[1] Report of a study made under the supervision of the Visual Instruction and Editorial Section, Division of Extension Information, Extension Service, United States Department of Agriculture, October 16, 1939, to February 16, 1940.

DISTRIBUTION: A copy of this circular has been sent to each extension director, visual instruction specialist, extension editor, agricultural-college library, and experiment-station library.

1237-40

CONTENTS

Foreword..... 3

What is meant by visual aids?..... 4

Visual aids help in big business..... 6

Extension workers use visual aids..... 6
- Film strips of community activities attract crowds.. 6
- Demonstrations and visual aids..... 7
- An agent tries motion pictures..... 8
- A mixture of picturial aids..... 9
- Annual reports indicate visual aids used..... 10
- Questionnaire answers indicate use of and problems with visual aids..... 10

Extension visual aids and how to get them..... 12
- Cameras..... 12
- Black and white prints..... 14
- Miniature (2- by 2-inch) slides..... 15
- Film strips..... 16
- Films..... 20
- Motion pictures..... 22
- Projectors..... 22
- Screens..... 23
- Charts and graphic presentation of facts..... 24

Summary and conclusions..... 25

FOREWORD

This paper is the result of a study made during a 4-month leave granted by the Ohio Agricultural Extension Service for professional improvement. The report is based on a review of published material on visual aids, of numerous reports of extension workers filed with the Extension Service of the United States Department of Agriculture, and on personal observations and conferences with extension workers in Virginia, South Carolina, Alabama, Mississippi, Louisiana, Arkansas, Missouri, Indiana, Ohio, and Pennsylvania.

The observations are more (or less) than reportorial efforts. I have injected my personal opinion freely. Such opinion, I hope, is substantiated or justified by conditions existing today or the probabilities of the immediate future. I have confined the study largely to those phases of visual aids that have been used in cooperative extension work in agriculture and home economics.

I am grateful to Director H. C. Ramsower of the Ohio Agricultural Extension Service, and to the system in Ohio, which permits the granting of leave to extension workers for professional improvement, for making available the time necessary for this study; to M. C. Wilson, in charge of extension surveys and reports in the United States Department of Agriculture, for his helpful advice; to Cora L. Feldkamp, librarian, Office of Experiment Stations, for courteous and patient help in obtaining references; and particularly to Lester A. Schlup, Reuben Brigham, and C. W. Warburton for their help and guidance in making this study a pleasant and enjoyable one. To one and all of them, I am gratefully appreciative.

J. E. McClintock
Extension Editor

WHAT IS MEANT BY VISUAL AIDS?

To an extension worker, a visual aid is anything which, when properly shown, helps the person or persons to whom it is shown to understand the subject being discussed at that time.

A review of printed literature on the subject at this time, December 1939, would indicate that the answer was "Motion pictures." Most printed reports refer to the use of visual aids (motion pictures) in schools. The reports of a few extension specialists in visual instruction also might lead one to think that their work consisted largely in distributing motion pictures to the schools of the State.

School reports indicate the value of visual aids used in connection with carefully supervised teaching methods.

Cooperative extension workers in agriculture and home economics must recognize, however, that the well-organized American school system is very different from the field of cooperative extension work.

One is compulsory. The other is voluntary.

One is well organized and backed by Federal, State, county, and local school systems. The other is very loosely, if at all, organized.

One is limited to youths who are carefully graded according to educational attainments. The other includes adults and youths of all degrees of educational attainments and experiences.

For one, equipment may be carefully selected, its use planned and coordinated with a standard, prescribed course of study. For the other, the aids may have to be made, and adjusted to the subject at hand, to the teacher, to the place where they are to be used, and, most of all, to the audience.

One might, from the variety of reports on results of using visual aids, ask, are visual aids of definite value in extension work? Maybe one picture is <u>not</u> worth ten thousand words. Maybe that Chinese adage was based on opinion and not on well grounded observation. Is the adage justified by facts? Has anyone proved that <u>the seeing of things</u> makes more lasting impressions than <u>the seeing or the hearing of words</u>? Is it a well known fact that children, as well as adults, receive impressions of the world about them in a great measure through the eye?

Again, most of the evidence of a positive nature has resulted from well planned tests, carried out in our public schools.

For example, the names of thirty common objects, selected because they were thought to be equally well known by several hundred

school children, were divided into three groups. (1) Ten names were pronounced to the pupils. (2) Ten names were written on the blackboard and covered. The pupils were permitted to see one name and it was then erased. This procedure was followed for the ten names. (3) Each name in the third list was pronounced to the pupils as the object named was shown to them.

Which list of names did the children remember? The answer is given in the following table.

Method of presenting names to children	Average number of words remembered by pupils	
	Immediately	After 3 days
Words spoken by teacher.....	7.1	1.0
Words shown on blackboard.....	7.2	2.0
Words spoken and objects displayed.....	8.6	6.5

Did the sight of the objects aid the children to remember the names? There was little difference in the immediate results, but a striking difference after the lapse of 3 days. Numerous examples of this nature could be cited.

Many other tests of the use of visual aids in schools have been reported in detail. Much interesting material may be found by consulting the following:

Douglass, Earl Roy, Modern Methods in High School Teaching, Houghton Mifflin, 1926, 544 pp.

Erickson, C. Irving and King, I. A Comparison of Visual and Oral Presentation of lessons in the case of pupils from the third to the ninth grades. School and Society, v. 6, pp. 146-148 (Aug. 4, 1917.) 1917.

Freeman, Frank Nugent, ed. Visual Education, University of Chicago Press, 1924.

Kenagy, Herbert Glenn and Yoakum, C. S. Selection and Training of Salesmen, McGraw-Hill, 1925. 380 pp.

Kirkpatrick, E. A. An Experimental Study of Memory, Psychological Review, v. 1, p. 602. 1894.

Lacy, John V. Relative Value of Motion Pictures as an Educational Agency, Teachers' College Record, v. 20, pp. 452-465. Nov. 1919.

Moore, Thomas Verner, Image and Meaning in Memory and Perception, Psychological Monographs, No. 119, p. 281, 1919.

Révész, G., and Hazewinkel, J. F. The Didactic Value of Lantern Slides and Films, British Journal of Psychology, v. 15, no. 2, pp. 184-197. Oct. 1924.

Sumstine, David R. Comparative Study of Visual Instruction in the High School, School and Society, v. 7, pp. 235-238. Feb. 23, 1918.

Tilton, John Warren and Knowlton, Daniel Chauncey. The Contribution of Ten Chronicles-of-America Photoplays to Seventh-Grade History Teaching, Journal of Social Psychology. v.1, pp. 78-95. Feb. 1930.

Weber, Joseph J. Comparative Effectiveness of Some Visual Aids in Seventh Grade Instruction, New York, Educational Screen [Inc.] 130 pp. 1922.

Worcester, Dean A. Memory by Visual and Auditory Presentation, Journal of Educational Psychology. v. 16, pp. 18-27. Jan. 1925.

VISUAL AIDS HELP IN BIG BUSINESS

The salespromotion and advertising manager of one of the largest corporations in America says: "Since entering the field of visual education some years ago, we have used this medium consistently, and to an increasingly greater degree.

"We are using slide films, motion pictures, charts, graphs, and photographs to carry our sales messages to our salesmen and to the dealers who market our products. We have found that the old saw, 'Don't tell 'em, show 'em,' has a modern improvement, for with visual aids it is possible not only to tell 'em but to show 'em at the same time. If the system works in explaining sales and merchandising methods, there should be no reason why it should not apply equally well in demonstrating effective agricultural methods."

EXTENSION WORKERS USE VISUAL AIDS

Film Strips of Community Activities Attract Crowds

Fortunately, experiences of extension workers throw some light on the value of using visual aids in extension work. For example, R. B. Rankin, county agent of Adair County, Ky., writes in the November 1939 issue of the Extension Service Review under the heading, Making and Using Film Strips, as follows:

"It has always been difficult to get a large number of persons to see demonstrations when they were at their best. So, in order to present the results of extension work to many who otherwise might never see or hear of them and yet many of whom might need such information most, we decided to record the results on film strips.

"The cost of equipment, including candid camera, projector, and four film strips completed ready for projection, approached $50. In making a film strip, we used a candid camera which cost $12.50 and 35-millimeter Reversible Superpan film, which is sufficient for 35 scenes.

"Most of our best pictures were made in clear sunlight with a lens setting of f.6.3 and a shutter speed of one-hundredth of a second, as recommended by the camera manufacturer. No one needs to be any sort of photographic technician to make good film strips. When exposures are completed on the film mentioned above and it has been processed in the manufacturer's laboratories, it is ready for projection.

"The projector cost about $35 and can be used for either film strips or for 2- by 2-inch slides. Current from either a 110-120-volt line or a 6-volt automobile battery may be used by changing bulbs. Although an expensive screen might be desirable, we have found the use of a sheet or a cheap white window shade very satisfactory.

"If public interest continues, we plan to make three or four strips each year on subjects of most importance to the county.

"Average attendance at meetings where it is known that these pictures are to be shown has been much better than in many other types of meetings. All classes of persons in the community are attracted, including old and young, rich and poor, thus refuting to some extent the common contention that extension work often reaches only a select group. Explanations of the pictures are of course necessary, but are kept as brief as possible to make the points. The exhibition and explanation seldom exceed 45 minutes. Persons attending usually see pictures of practices carried out by farmers they know, and this, we believe, is one of the strong points of the locally made film strip. The observer is bound to admit that it can be done in his own county."

The use of 2- by 2-inch color slides is a little more expensive, but, in the opinion of the writer, the extra cost is more than justified in the added interest and in the more vivid portrayal of local scenes. Some extension workers have said, too, that as rapidly as possible, the "bed sheet" screens should be replaced with glass beaded screens. This is especially true where projection is done during the day in poorly subdued light and where 6- and 32-volt lighting outfits are used.

Demonstrations and Visual Aids

Another county agent, A. D. Carew, of Green Lake County, Wis., says in an article appearing in the November 1939 issue of the Extension Service Review under the caption, Worth a Dozen Night Meetings:

"I have had a feeling for a number of years that more effective teaching and lasting impressions can be made by actually working with objective materials. For example, if I make a farm visit and while there prune a fruit tree, I believe that the farmer will remember the visit much longer and that I will have a closer tie-up with the farm.

"Putting this theory into practice, I had a self-feeder built according to the Wisconsin plan. I bought a sack of tankage and a sack of linseed meal and loaded these materials on a truck, having arranged in advance for four meetings on farms in the chief hog-growing sections of the county. Farmers could actually see just how the feeders were made and were furnished plans by which to build them. When the truck pulled into a farmyard, it was greeted by from 30 to 50 swine men. This device enabled us to outline a swine sanitation program as well as to talk feeding.

"For another series of meetings on farms to acquaint farmers with anemia in little pigs and how to prevent it, I announced that I would carry with me a supply of iron and copper solution to be distributed at cost to those who attended the meetings, and asked them to bring containers. We demonstrated how to use this material and again had very satisfactory attendance.

"Other types of meetings we held on the swine project were butchering and meat-cutting demonstrations, where we actually showed the farmers how to perform those tasks.

"I believe that such meetings held on farms, at which you actually show farmers certain good practices, are worth a dozen night meetings held in a hall."

Mr. Carew describes demonstrations pure and simple. But, in his demonstrations he used visual aids effectively. His audience saw as well as heard what he had to say about what he did. By following this method, extension agents and specialists of all projects could find visual aids that could be used. A list of such aids used by specialists and reported by them to C. B. Smith in 1937 appears on page 40.

An Agent Tries Motion Pictures

Next, let's see what another county agent has done with motion pictures. Ormann R. Keyser, county agent in Stark County, Ohio, made a two-reel (800 feet), 16-mm. motion picture, mostly in color, entitled "Save the Soil for Son."

The picture opens with the subtitle, Rain.....Friend and Enemy of the Farm. A number of pictures of pelting rain follow the subtitle. They are long shots, medium shots, and close-ups and show the very beginnings of erosion, both the common gullying sort and the more deceptive sheet erosion. Special attention is directed to sheet erosion, the hardest form to recognize, yet the most persistent in its destructive results.

These results are portrayed by the pathetic scenes of abandoned farms, denuded hillsides, and tumble-down farm buildings, built on and from the surrounding acres that were once wonderfully productive.

Then appears a second subtitle, Friend, in Bringing the Life-Giving Moisture to Growing Crops. Following this subtitle are pictures of various crops in excellent growing condition, all local, and all taken in bright sunlight. Keyser here shows contour strip farming, gully damming, tree planting, and other erosion-control practices.

A third subtitle, But a Relentless Enemy, in Its Deadly Destruction of a Farmer's Prime Possession.....His Soil, is followed by more pictures of heavy rain, close-ups showing the soil structure weakening and slowly sliding into little rivulets of mud that tumble away into deeper gullies, then into a torrent-washed ravine, and finally into the river.

Mr. Keyser says (December 1939) the film has been shown about 50 times in Stark and many times in the surrounding counties. It was shown at farmers' institutes, grange meetings, meetings of the Farmers' Union before Smith-Hughes schools, luncheon clubs, and at other gatherings. Many communities have asked for it the second time. The Wooster High School, in an adjoining county, used it twice and then requested it to show at their parent-son banquet. A Soil Conservation Service representative says that it has had a profound effect in the county toward that work. Mr. Keyser modestly admits that it has been enthusiastically received wherever it has been shown. H. C. Ramsower, Director of Extension Service in Ohio, said this film was the most effective and impressive object lesson on the local erosion problems and suggestion of methods for their solution that he had seen. He also stated that its production and showing in Stark County would more than justify the entire expense of a county agent to that county.

A Mixture of Pictorial Aids

"The Picture Man" is the nickname acquired by County Agent J. Robert Hall of Linn County, Mo.

Why?

Because he displays 8- by 8-inch pictures, properly captioned, in 15 business places in his county. These pictures are changed each week. County Agent Hall takes the pictures, develops the negatives, and prints the enlargements that he posts in his picture boards. He also uses many film strips of local people, and, of course, of local farm and home activities. He says in the July 1939 issue of the Extension Service Review, page 105, "A single film strip of 50 pictures may show a few thousand people. These folks want to come to community meetings to see themselves. At these meetings I use other film strips on timely subject matter."

"Some years ago," writes Hall, "the extension program in Linn County needed more support, financially and otherwise. The required

support was easily obtained by making and showing a county motion picture. .....From the time of its showing, extension took on new life."

Many other testimonials from and experiences of extension agents could be added, but those already given are sufficient to indicate the possibilities and to some extent the use now made of visual aids by county extension agents.

Annual Reports Indicate Visual Aids Used

The annual reports of State extension directors, leaders, supervisors, specialists, and extension agents, nearly 10,000 in all, are read and indexed in the office of the Federal Extension Service. The indexing is based on the impressions the reports, or portions of them, make on the readers. Items that are considered accomplishments, results, or outstanding, are indexed.

The item, motion pictures, arrested the 1938 report readers' attention 109 times. Lantern slides and film strips combined were considered worthy of 39 indexings. Photographs stopped the indexers 35 times; charts, 33 times; posters, 19; models, 5; and maps, 4 times. These types of visual aids were indexed for about 2½ per cent of all the 1938 reports.

Questionnaire Answers Indicate Use of and Problems with Visual Aids

The answers of State extension specialists to item 6 of the questionnaire sent out by C. B. Smith, Assistant Director of Extension Work of the United States Department of Agriculture on January 4, 1937, is interesting. The item reads: "Describe any special illustrative material and devices you have developed to assist in presenting your subject matter effectively." Specialists interpreted the word "developed" to mean developed or used.

The 64 specialists in home-economics projects who answered the questionnaire mentioned "material and devices" 158 times but did not mention motion pictures. They mentioned specimens, such as garments, samples of foods, or pieces of cloth, 43 times; charts, 22 times; models, 17; photographs and pictures, 15; posters, patterns, toys, and demonstrations, 7 times each; food containers, 5; books, living models, labels, and food exhibits, 3 each; drawings, 2; and 1 each for blackboard, color wheel, bandages, first-aid kit, sickroom devices, layette, slides, opaque projector, repair tools, silhouette camera, rats, food for an adult for 1 year, hand loom, and flat chip (the last unexplained).

The 291 specialists in agricultural projects who answered the questionnaire mentioned charts 70 times; specimens, 65; models, 36; photographs, 27; blackboards, 25; slides, 23; film strips, 20; and motion pictures, 16 times. Thirteen other illustrative materials and devices were mentioned from 1 to 14 times each.

From this response, one could hardly say that motion pictures were one of the major visual aids of agricultural specialists.

A list of those aids mentioned by both the specialists in agriculture and home economics, is given in the accompanying table.

Visual Aids Mentioned in Reports of Agricultural and Home-economics Specialists

Devices mentioned by agricultural specialists	Times mentioned	Devices mentioned by home-economics specialists	Times mentioned
Charts	70	Specimens	54
Specimens	65	Charts	22
Models	36	Models	20
Photographs	27	Photographs and pictures	15
Blackboards	25	Posters	7
Slides	23	Patterns	7
Film strips	20	Toys	7
Movies	16	Demonstrations	7
Demonstrations	14	Books	3
Sketches, cartoons, and drawings	12	Food exhibits	3
Plans	11	First-aid kits and sick-room devices	3
Posters	10	Drawings	2
Exhibits	9	Blackboard	1
Graphs	5	Colorwheel	1
Maps	5	Layette	1
Tables	5	Slides	1
Moving devices	5	Opaque projector	1
Opaque projectors	2	Repair tools	1
Color wheel	1	Silhouette camera	1
Transparencies	1	Rats	1
Total	362	Total	158

Note that the first four items in each list are the same. Charts, specimens, models, and photographs constitute 55 percent of all aids mentioned by the agricultural specialists, and the same aids, though arranged a little differently, make up 70 percent of those mentioned by the specialists in home economics.

Another interesting item in connection with the use of visual aids by extension specialists was brought out in response to item 8 of the questionnaire: "Difficulties encountered in preparing and/or using illustrative material." The answers to this question are given in the accompanying table.

The data given in this table indicate that the bulk of the specialists' troubles fall into three general classes, namely, the lack of time, funds, and ability. About 65 percent of all difficulties connected with preparing and using illustrative material is included in these three classes.

Difficulties Encountered in Using Visual Aids

Difficulty	Times mentioned by--	
	Women	Men
Lack of time	55	75
Lack of funds	39	50
Lack of ability	18	46
Poor equipment	14	22
Transportation	11	18
Available material not adaptable	-	21
Loss of material	9	2
Space for making, handling, storing	9	-
Limited personnel	8	13
Getting and keeping material up to date	6	-
Limited source of material	2	-
Finding (free) material	1	8
Available material too complicated	-	7
Material not suitable for reproduction	-	2
Total	172	264

EXTENSION VISUAL AIDS AND HOW TO GET THEM

Up to this point, this study has attempted to picture visual aids in the field of agricultural extension. This picture has been drawn from published reports. As must be expected, reports are often old when published. However, they do indicate trends.

The rest of this report will attempt to deal with helps to the extension worker who wants to make more use of visual aids in connection with his or her work. Photography is basic in many visual aids. For this reason, classes of aids based on photography will be discussed first.

Cameras[2]

We use cameras to take pictures. Regardless of what kind of picture is desired, some kind of camera must be used. What kind of camera shall I buy?, is asked thousands of times each year by extension workers. It was asked so often that a circular was written by C. H. Hanson, formerly of the Extension Service, United States Department of Agriculture, on that very subject and duplicated. At this writing (January 1940) the circular

[2] A list of cameras that use regular spools of 35-millimeter film may be obtained from the Extension Service, United States Department of Agriculture, Washington, D. C. (Stencil No. 1228-40.) This list may not be complete, nor are the cameras listed necessarily approved by the Department.

is still available. It contains much valuable information about the advantages and disadvantages of various types of cameras - box, folding roll-film, miniature, reflex, and view. That discussion will not be repeated here except to say that in a general way "the price of a camera is usually an accurate index to its value and efficiency. The best cameras are precision instruments, the making of which requires skill of a high order. Naturally, the cost of such cameras is high." To Mr. Hanson's statement, I wish to add that a greater degree of skill is required to operate a precision instrument correctly than is required to operate a cheaper, less precisely built camera.

One should bear in mind that the ability of the photographer varies. He is never so nearly perfect that he cannot improve. The camera is merely a mechanism and has its limitations. They are known and recognized. Therefore, the photographer should not blame the camera for photographic failures.

A few rather standard suggestions for the use of hand cameras follow. Everyone who has read anything about photography has read these hints. There is nothing new in them, but they are still good. Most successful cameramen follow them either consciously or unconsciously.

A picture should:

Tell a definite story.
Emphasize some one story.
Suggest action.
Be taken near enough to the subject to eliminate immaterial surroundings.
Have an inconspicuous background.
Have a clear foreground.

In using a camera:

Be methodical and careful.
Do not allow sun to shine directly on the lens; use a sun shade.
Have sun (if possible) at an angle to the rear.
Have lens clean.
Use fresh film.
Keep the camera level.
Never hold a camera in the hands when exposing longer than 1/25 second (1/100 second is safer for some people).
Carry a <u>tripod</u> and <u>use it</u>.
Remember that a good exposure meter is not deceived by light conditions and that your guess may be the cause of a disappointment.
Without a light meter, remember this basic exposure for ordinary film at 1/25 second.

Brilliant light, use stop.....	f 16
Bright light, use stop.....	f 11
Light cloudy light, use stop.....	f 8
In shade with good reflected light, use stop..	f 5.6

With Kodachrome use an exposure meter or follow the manufacturer's suggestions on making exposures.

Black and White Prints

The products of the camera are numerous. First, there are the old stand-bys, black and white prints. They may be passed from hand to hand or enlarged and set before a group. If they are good pictures, each tells a story. If that story happens to be one that the extension worker wants told at that particular time, the picture aids him in his teaching. Otherwise, it is just another picture.

Some specialists carry about with them their State albums of prints. They claim that many farmers can get more information from one glance at a picture than they can from listening an hour or more to descriptive lecturing.

The use of film strips, slides, and motion pictures - all forms of pictures - may tend to relegate black and white prints into the discard. That would be unfortunate, as they are the staple photographic product. Of course, to be of the most use, the right picture must be used at the right time and place. To help make this possible, a good working file of up-to-date pictures is desirable in all extension offices. It is from black and white prints that cuts for all kinds of illustrations are made. They are even used to illustrate annual reports.

The extension worker who rides a hobby early and late may deserve a nickname such as the "picture man." But what of it?

If, by the use of pictures, the extension worker puts across his, or her, ideas in an instructive and impressive way, he proves his teaching ability. Whether or not his methods meet current pedagogical standards does not matter. If they prove generally successful, the pedagogues will adopt them.

All extension workers are not and cannot become expert photographers. But most specialists and agents can take pictures or can find someone who will take them under their direction. In the author's opinion, the specialist or the agent who is out in the field knows best what subjects should be taken for an instruction picture; he knows, too, when that picture should be taken to show just what he wants it to show. He cannot delegate that chore and expect the photographer to see the same picture that he who is living with the subject sees. He who does delegate this chore should not blame the photographer for not getting the right setting, angle, or background. His eyes are not your eyes.

Yes, it takes time to take pictures. Can you as an extension worker afford to take the time? In the opinion of the writer, few extension agents or extension specialists can afford not to take the time.

A good photograph depends a great deal more on the photographer than on the camera with which he works. The person taking the picture must have an interest in taking it. If he has that, he will learn something about photography. He will study the camera and its operation, the picture to be taken - its composition, its lighting, its naturalness,

its appeal, its ability to hold interest, what it shows, its use. If his interest is sufficient, he will follow through with the development of the negative and the making of the print. However, it is not the purpose of this report to enter into a discussion of darkroom operations - important as they are to good photography.

Miniature 2- by 2-inch Slides

The writer is convinced that the 2- by 2-inch slides, especially those in color, will, in the next few years, largely replace the old 3¼- by 4-inch glass slides, film strips, and motion pictures in extension work. Because of this conviction, more space is given to the small 2- by 2-inch slides than has been given to them heretofore. In fact, relatively few references to them can be found in literature today (1939). Hereafter in this paper, when 2- by 2-inch color slides are mentioned, Kodachrome is referred to. Other color films may be used, but our experience has been confined largely to the one mentioned. It is for that reason and that only that we refer to it. Other color film may now be on the market or may soon be developed that will prove superior for amateurs.

In the first place the 2- by 2-inch slides are inexpensive. They should not cost more than 15 cents each, even in color. They are relatively easy to make and are adaptable to local conditions. The film is practically without grain and will stand enlargement well. The slides are light; 14 of them "readymounts" - just as they are received from the processor - weigh 1 ounce, and 50 weigh just a little more than 3½ ounces. Fifty of the old 3¼- by 4-inch slides weigh about 6 pounds, almost 30 times as much as 50 of the cardboard-mounted miniature slides. Fifty of the readymounts with a cover glass on each side weigh 25 ounces, or just about one-fourth of the weight of 50 of the old-time slides. The 2- by 2-inch slides can be carried easily. A set on any subject can be selected readily and arranged as wanted. Those in color excel in portraying many conditions. Variations in the color shades of pastures, or of foliage in general, have been exceedingly hard to show in black-and-white slides or in photographic prints. With the 2- by 2-inch slides "what you see, you get," if you are careful. Diseased condition of plants shows well in color where black-and-white photographs fail. Typical specimens of fruits, flowers, or breeds of poultry and livestock can be shown as never before.

Combinations of color in dress and in home furnishing can be shown to advantage and inexpensively. This should be a boon to home economics specialists who, for many years, have longed for some way to show color combinations and harmony. Opportunity stands before you, ladies. Embrace it!

Another suggested use for miniature slides is to replace charts, tables, maps, graphs, plans, mounted photographs, and diagrams when used in connection with lectures. I found specialists in Virginia, Ohio, and Pennsylvania who reported using them successfully for this purpose. Many extension agents in Pennsylvania send data typed in tabular form to the State office, where the table is photographed on a 2- by 2-inch slide and returned to the agents.

The use of miniature slides is another forward step in visualizing extension work. However, they are not without their faults. The size usually 1½- by 1-inch for the projected part of the slide, is but one-fifth the size of the projected part of the old or regular 3¼- by 4-inch slide. This means that the smaller slide must be enlarged five times as much as the old one to produce the same size screen picture. But, projectors have been perfected so that this increased enlargement is possible.

For best results, pictures for reproduction or original slide films should be taken by the person who is going to use them, or the taking should be directed by him. He or she knows exactly what is to be shown, and should be best qualified to see that those features appear to advantage in the picture. If the picture is to be projected as a 2- by 2-inch slide, to take it on 35-millimeter film may be best; (1) the regular black and white film can be used from which positives can be made, (2) reversible film, which, when developed or processed by the manufacturer, is a positive and is ready to be cut into frames for slides, or (3) on Kodachrome (color) which is processed and mounted on cardboard slide frames by the manufacturer. This service is included in the original price of the film. On request, the film will be returned to you in the roll and the film can be cut up and the individual pictures mounted between glass covers. Or, cover glasses may be added to the readymounts. The glass protects the film but makes thicker and heavier slides.

Film Strips

Film strips - a number of film slides in one continuous film strip - enable the extension teacher to place much visual material before an audience at very little expense. The arrangement of the pictures is set, but some people seem to like that. It is a chore done. Anyway, many film strips are available at prices ranging from 50 cents up.

The 1940-41 price list of the United States Department of Agriculture Extension Service carries titles of nearly 350 films.

The number of pictures or frames on a film vary from 20 to perhaps 75, and prices are from 50 to 65 cents each.

The following table gives some idea of the general subjects covered.

Classified under	Number of strips
Agricultural adjustment	8
Agricultural economics	18
Agricultural engineering	14
Dairying	17
Extension work	37
Farm credit	1
Field crops	28
Fire prevention and control	4
Forestry	19
Home economics	15

Classified under	Number of strips
Horticulture	16
Insects	44
Livestock	54
Marketing	13
Miscellaneous	9
Plant diseases	13
Roads	4
Rodents	1
Rural electrification	5
Soil and soil management	43
Wildlife	4
	367

This list is revised each year and the latest copy should be on file in the office of each extension agent.

The value of a film strip, like the value of 2- by 2-inch slides, depends largely on local application. To have the greatest local application, a film strip should be made from pictures of local people, events, homes, fields, gardens, orchards, fairs, streets, schools, roads, and neighborhood scenes.

The Extension Service of the United States Department of Agriculture aids extension workers anywhere in having film strips made from home-made pictures, or from pictures selected by the extension worker. The following hints on organizing photographs for film strip production and also the price schedule for having strips made are from a circular sent to all extension workers in July 1939. For the person who wants to make a film strip from local pictures this should be helpful. Also, Miscellaneous Extension Publication No. 41, Life for Our Talks - How to Build Film Strips that Visualize the Extension Message, gives in such a complete manner suggestions for making up film strips, that additional suggesions here seem superfluous.

Hints on Organizing Photographs for Film-Strip Production

(U. S. Department of Agriculture, Extension Service, July 1939)

Film strips can be made from anything that can be photographed. However, best results cannot be obtained unless the copy submitted is of good quality and prepared in convenient form for efficient handling in the contractor's laboratory. The following suggestions are but a few of the important factors in obtaining a satisfactory finished product.

1. Photographic prints

   a. Good quality black and white prints ranging in size from 2- by 2- to 8- by 10-inches are satisfactory. Do not submit illustrations from bulletins or magazines.

b. Horizontal pictures are most satisfactory. Bear in mind that the proportion of a single-frame film-strip frame is as three (vertical) is to four (horizontal); for a double-frame film strip, the proportions are as two to three.

c. Submit prints untrimmed.

d. Do not write or paste any typewritten matter on the reverse of the prints. Also avoid the use of paper clips in attaching legends to photographs. Merely number the photographs lightly on the reverse side in the order in which they should appear in the film strip.

2. Legends

a. Where legends are desired, they should be as short as possible - not over 9 or 10 words and 2 lines in length.

b. White lettering on black background is most satisfactory.

c. Legends can be placed under, beside, or on the illustration as may be preferred.

3. Readers

a. Where readers or subtitles are desired, they should not exceed 40 words - preferably 30.

b. All copy should be carefully edited.

4. Charts and drawings

a. All lines should be heavy and black. A common mistake is to have the drawings too large and the lettering too small and fine. Simplicity and boldness should be the aim in preparing charts and graphs.

5. Submitting material for film strip production.

a. When the cooperation of the Extension Service of the United States Department of Agriculture is desired, all material presented for preparation of film strips should be transmitted through the state extension division for approval.

b. Submit a numerical typewritten list showing continuity of illustrations.

c. Complete instructions should accompany original material.

d. Present copy for the preparation of title, credit, and reference frames.

6. Service offered to extension workers

   a. As a matter of service, without cost, the United States Department of Agriculture will prepare a suitable title, credit, and reference frame as well as trim and mount the photographs. No change will be made in the subject matter.

   b. Allow at least 3 to 4 weeks for organizing the material for film strip production and an additional 15 days for the making of the negative by the contractor.

   c. For further information write to the EXTENSION SERVICE, UNITED STATES DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.

Prices of Film Strips for State and County Extension Workers

(U.S. Department of Agriculture Extension Service, July 1939)

	Single frames	Double frames
	Cents	Cents
1. For making of negative		
a. Price per frame.	10	15
2. For printing subtitle cards		
a. White lettering on black background. . . . . .(each)	25	25
b. Black lettering on white background. . . . . .(each)	20	20
3. For printing legends		
a. White lettering on black background. . . . . .(each)	10	10
b. Black lettering on white background. . . . . .(each)	10	10
4. For trimming and mounting legends on illustrations		
a. Price per legend	10	10
5. For printing of graphs and tabulations		
a. White lettering on black background. . . . . .(each)	50	50
b. Black lettering on white background. . . . . .(each)	40	45
6. For supplying positive prints from State and county film strip negatives. Prices are determined by length of film strip.		
Film strip positives not exceeding 50 frames in length:		
a. 1 print.	50	100
b. 2 to 9 prints per order. . . . . .(each)	45	90
c. 10 to 50 prints per order. . . . . .(each)	25	85
Film strip positives not exceeding 65 frames in length:		
a. 1 print.	55	125
b. 2 to 9 prints per order. . . . . .(each)	50	100
c. 10 to 50 prints per order. . . . . .(each)	30	95

Prices of film strips, etc. - continued	Single frames	Double frames
	Cents	Cents
6. For supplying positive prints from State and county film strip negatives. Prices are determined by length of film strip. Continued.		
Film strip positives over 65 frames in length for each additional 16 frames or fraction thereof:		
a. 1 print.	5	25
b. 2 to 9 prints per order.	4	20
c. 10 to 50 prints per order.	3	20

Prices subject to change on July 1, 1941.

NOTE: The contract specifies delivery within 15 days after receipt of formal order or remittance. A special clause has been incorporated in our contract in order to obtain 5-day delivery. The cost for this special service is 10 percent over and above the actual price of the preparation of the film strip negative and the number of positives desired.

Films

Assuming (1) that the extension worker sees a situation that can, in his or her opinion, be cleared to those concerned by the use of miniature slides, (2) that he knows just where the subject is that should be taken, and (3) that he has a camera. What then?

Take the picture.

On what kind of film?

That depends upon the subject and the light.

One of the big problems of the one-camera worker is that all subjects cannot be taken equally well on all films. Some subjects can be taken only on fast black and white film. Other subjects can best be reproduced by the use of color film. Color adds to the appearance of almost any picture. If the light will permit the use of color film, it is not so "out of the picture" because of the cost. The original price of Kodachrome film includes processing and mounting in cardboard frames, ready for showing.

The most common (1939) films in 35 millimeters, together with speeds and special uses are listed in the table following.

Popular Reference Chart for 35-millimeter Film

	Weston speeds		Am. Scheinor speeds for extinction type meters		Uses . Special qualities
	Day-light	Tung-sten	Day light	Tung-sten	
Agfa Infra-red	2*	--	11*	--	Haze cutting
Fine-grain plenachrome	24	12	24	21	General, wide exposure latitude
Fine-grain reversible superpan	24	16	23	21	Positive transparency
Finopan	24	16	24	23	For extreme enlargement
Superpan supreme	64	40	26	24	Very fast
Ultra-speed panchromatic	125	64	29	27	Night shots - extremely fast
Dufaycolor	8	3	18	14	Color transparency
Dupont Infra-D			20	18	Haze cutting
Positive			12	2	Positive transparency
Micropan	6	4	17	15	Fine grain - contrasty
Fine grain parpan	10	8	19	18	Contrast
Superior panchromatic	40	24	25	23	Wide exposure latitude
XL pan	64	40	27	24	Fast - wide exposure latitude
Eastman Infra red	4	6	--	--	Haze cutting
Kodachrome regular	8	3†	18	--	Color transparency
Kodachrome Type A	8+	12	--	21	Color transparency
Kodak Pantomatic-X	32	20	24	22	Contrast
Kodak plus-X	40	24	26	24	Fast
Kodak super-XX	100	80	29	27	Very fast-night shots

* With dark yellow filter

† With filter recommended by the manufacturer

Most of the film listed can be secured in bulk as well as in spools ready to insert in camera.

1237-40

Motion Pictures

What about motion pictures as aids in extension teaching?

Good, bad, and harmless. There are too many in the last two classes - pretty pictures attuned to soothing melodies, accompanied with mysterious, ghostlike voices, floated onto silvery clouds. Educational? Not often. They draw a crowd, they entertain, and they develop mass interest and enthusiasm for the picture and maybe in the subject. They carry a degree of authority denied to the printed and to the spoken word. "I saw it with my own eyes" is an argument hard to break down. If practical farm folk see through the artificiality of a picture (or of motion pictures in general), they may be as guardedly skeptical of that which they "see" as of that which they hear. Professor Edgar Dale in The News Letter of April 1940, says the movie is a powerful propagandizer, because you see it in a darkened room, on a lighted screen, and while in a mood for being entertained. He says even a child remembers something of what it sees in a movie.

Therefore, movies used in extension teaching should show something of value to the subject taught. Where they are followed with information in the form of talks, or with other pictures, movies seem justified. They are expensive to produce. But, so long as they draw crowds, they will be used. Like all pictures, to be effective aids in extension teaching, they must be carefully selected. Because of expense, shots of local events, practices, people, and scenes are the exception, not the rule.

However, the Pennsylvania Extension Service had, in February 1940, 119 motion picture films (16 millimeter) in its library for the use of extension agents and specialists. All but six of those films were taken on Pennsylvania farms or in Pennsylvania homes. Many of them were taken by the specialists, others by the county agents, and the rest by the specialist in visual education. The specialists in that State like to do their own talking even in connection with motion pictures. Therefore, the silent movies have not given much ground there in favor of the talkies.

Projectors

After the slides are available, how can one show them?

Projectors for these small slides, including the carrying case, are not much larger than a shoe box and weigh from 4 to 7 pounds. Anybody who can snap an electric light on and off or wind a watch can operate them.

In well-darkened rooms and for small audiences, the smaller projectors are satisfactory. The more daylight one has to contend with, the more powerful should be the light in the projector. Also, the larger the projected picture, the thinner is the light spread over that picture. Therefore, do not project the picture larger than is necessary for your audience to see distinctly. Also, use the best projector that you can afford.

Projectors are now on the market with from 100- to 750-watt light bulbs. These projectors, in a dark room and with a good beaded screen, produce pictures up to 14 feet wide that are perfect. It is not often that a picture more than 4 feet in width is necessary to accommodate extension groups. Slides of any kind should never be enlarged more than necessary for the audience, properly seated.

A satisfactory projector is one which, with a good, clear slide, will produce a picture that is distinct, sharp, and clear all over. The size of the screened picture depends on the projection lens and the distance from the projector to the screen. The brilliancy of the projected picture depends on the slide, the screen, the bulb and lenses of the projector, and the focusing. A projector with a bulb of from 100 to 300 watts and in which the light is well controlled is desirable. The better the projector, the better the picture that can be projected from a good slide. A good, clean projector and a good screen will enable the operator to show all there is in any slide. Many projections of pictures are disappointing because of dirty lenses. All lenses in a projector should be kept clean.

New projectors for miniature slides appeared so frequently during 1939, that any list would, in all probability, be incomplete or out of date within a short time. At present, January 1940, projectors ranging in price from around $15 to nearly $500 are on the market. The more expensive ones are automatic projectors for continuous showing at fairs, conventions, and other gatherings where there is a large number of people to see the pictures, but only a few at a time. Those projectors will operate continuously, showing the same pictures over and over, or the operation may be directed by remote control by a lecturer. As many as 96 slides can be placed in some machines.

The bulk of the projectors on the market today sell for from $15 to $60 and are made or distributed by one of the companies in the following list. This list may not include the names of all manufacturers or distributors; neither are the products of firms named necessarily recommended. A line written to any of them will bring descriptive material and prices of their particular equipment.

Bausch & Lomb Optical Co., Rochester, N. Y.
International Research Corporation, Ann Arbor, Mich.
Leitz, Ernest, Inc., 730 Fifth Avenue, New York, N.Y.
Society for Visual Education, 100 East Ohio Street, Chicago, Ill.
Spencer Lens Co., Buffalo, N. Y.

Equipment may be ordered direct from the companies or it can, in most cases, be ordered through local dealers and sometimes at a discount from the list price of the merchandise.

Screens

Any light-colored surface can be used as a screen on which pictures may be projected. Light-colored walls, sheets of white paper, large white

cardboards, and bed sheets all make usable screens. However, for perfect projection and for convenience in use, the popular glass-beaded, portable screens are recommended. These screens in convenient sizes, on rollers, in metal cases, and mounted on tripods for quick use anywhere are available from firms handling such supplies. Such screens range in sizes from 22- by 30-inches to 70- by 94-inches. The smaller size will cost approximately $8. A tripod-mounted screen 36- by 48-inches may be obtained for perhaps $12.50 and one 39- by 52-inches for approximately $25.

Many houses handle the screens made by the Da-Lite Screen Co., 2723 Crawford Avenue, Chicago, Ill. An inquiry addressed to that company will bring information about a screen for any purpose and the name and address of your nearest dealer. These Da-Lite Screens should not be confused with the so-called "daylight" or translucent screens. Pictures may be projected on the translucent screens from the rear, and the lecturer may operate the lantern or projector himself. In such cases the pictures are projected through the screens. They are small and are not so easily handled as the more easily rolled beaded screens. There may be some advantage in the translucent screens in subdued light or in poorly darkened rooms during the day.

Charts and Graphic Presentation of Facts

Graphic presentation is as old as human records. It is a part of the earliest written messages. It is not surprising, then, that the graphic method has been developed, though relatively recently, for the popular presentation of data. The form of the presentation may be that of bar charts, pie charts, pictographs, line charts, maps, and probably many other forms. But, the fundamental principle of all forms of graphic presentation is simplicity.

A table helps to fix in mind a mass of numerical facts. A graphic form may further crystallize those facts in one's memory. The justification of tables and graphs of any kind in extension work is that they instruct and influence. If they fail in that, their use does not add to the ability of the audience to grasp and remember the facts presented.

R. G. Hainsworth, in charge of Graphics in the Bureau of Agriculture Economics, in an address before the American Farm Economics Association in December 1938, said in connection with the making and using of charts:

"It is well to make a small layout of a proposed chart or map to determine whether the data and method used show exactly the points to be illustrated. The layout may well be subjected to the criticism of a person other than the author, because disinterested persons will eventually evaluate the illustration in the final publication. The author who has a complete knowledge of all phases of the subject matter may draw conclusions from an illustration which are not evident to the uninformed reader. If there is any doubt as to the true meaning, the illustration should be modified or possibly discarded."

In the same address, Mr. Hainsworth pointed out three common mistakes in making and using statistical charts. They are:

1. The use of a few favorite types of charts, more or less without regard to the nature of the facts shown.

2. The use of too much imagination in the development of charts, making them so specialized and complicated as to be difficult to understand.

3. The use of charts and maps in groups, each on a different scale when all should be on the same scale; and the use of different-sized cuts to illustrate charts of the same general importance.

Then he explains by saying, "The first mistake leads to monotony and causes the readers to lose interest in the graphic method; the second, leads to a conviction that the method does not help to visualize the facts; while the third results in graphic presentation that may give a misconception of the true facts." Finally, he says, "Unnecessary maps, charts, and photographs are a decided hindrance to the effectiveness that is essential in presenting economic material. If too many illustrations are used, the continuity of the reading matter is destroyed and the expense is greatly increased."

Thus, one of the greatest authorities on graphic presentation of facts in the country recognizes that too much of the products of even his hobby is not necessarily good practice. Would it not be well, therefore, for specialists and extension editors to study well all the charts and graphs before incurring too much expense in their making?

SUMMARY AND CONCLUSIONS

Schools, big business, and extension workers use visual aids. Schools have proved their value as teaching aids. Big business has adopted them because they increase dividends. Extension agents and specialists accept them as teaching aids in adult education. In 1937 extension specialists reported charts, specimens, models, and photographs as constituting about 60 percent of all visual aids used by them.

Since 1937, a more concerted effort has been made on photographic aids than on all others. Photographic prints have always played an important part in cooperative extension work. Film strips proved an inexpensive way of showing photographs. Miniature (2- by 2-inch) slides, especially those in natural color, have recently (since about 1936) become popular because of the interest they create and the ease with which they can be made and used.

Motion pictures entertain, create mass interest and enthusiasm, and often convince the audience that a practice must be "true" because the members of that audience see it with their "own eyes." Motion pictures are

expensive. But, when taken of local events, practices, people, and scenes, they interest local people, hold attention, and can be made instructive.

A prophecy, a guess at a future condition, is always loaded with uncertainty. So many things can happen.

But, in the opinion of the writer, the present use of visual aids in extension work, and the seeming trend in the use of such aids indicate that the would-be successful extension worker might well acquaint himself or herself with the use of color 2- by 2-inch slides. That would include the use of (1) a 35-millimeter camera (they can be obtained at a price ranging from $10 to several hundred dollars); (2) a projector with sufficient light to show the slides; and (3) a convenient screen. Finally, the judicious and effective use of such equipment will, in all probability, increase the effectiveness of the extension worker.

Extension Service Circular 343 October 1940

Use of Visual Aids in Cooperative Extension Work in Agriculture and Home Economics

J. E. McClintock, Extension Editor
The Ohio State University

UNITED STATES DEPARTMENT OF AGRICULTURE
EXTENSION SERVICE
M. L. WILSON, *Director*
REUBEN BRIGHAM, *Assistant Director*
WASHINGTON, D. C.